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U. S. COAST & GEODETIC SURVEY
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Ed. June, 1928

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

R. S. PATTON, Director

State: FLORIDA

DESCRIPTIVE REPORT

~~Hydrographic~~ } Wire Drag
Sheet No. 2 5540

LOCALITY

FLORIDA KEYS

Fowey Rocks to Elliott Key
(Elliot Key)

193 4

CHIEF OF PARTY

HAROLD A. COTTON

U. S. GOVERNMENT PRINTING OFFICE: 1928

5540

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

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REG. NO.

5540

HYDROGRAPHIC TITLE SHEET
WIRE DRAG SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. 2

REGISTER NO. 5540

State FLORIDA

General locality FLORIDA KEYS

Locality Lowe Rocks to Elliott Key (KEY)

Scale 1:20,000 Date of survey May - Sept, 19 34

Vessel WIRE DRAG TENDERS MARINDIN AND RODGERS

Chief of Party HAROLD A. COTTON

Surveyed by HAROLD A. COTTON

Protracted by J. D. GROFF

Soundings penciled by _____

Soundings in ~~fathoms~~ feet

Plane of reference M.L.W

Subdivision of wire dragged areas by _____

Inked by _____

Verified by J. A. McCormick

Instructions dated November 17, 19 33

Remarks: _____

DESCRIPTIVE REPORT
to accompany
HYDROGRAPHIC SHEET NO. 2D
WIRE DRAG

FLORIDA KEYS

1934

SHORE PARTY NO. 3

HAROLD A. COTTON,
CHIEF OF PARTY.

DESCRIPTIVE REPORT
to accompany
HYDROGRAPHIC SHEET No. 2D(Wire Drag)
FLORIDA KEYS.

INSTRUCTIONS:

This survey was executed in compliance with the
Directors Instructions Dated November 17, 1933. *Project H.T. 158*

LIMITS AND CONTROL:

Same as for Hydrographic Sheet No. ____ (No. 2
H. A. Cotton - 1934)

AREA DRAGGED:

The wire dragging on this sheet consisted of the
following

(a) The entire length of Hawk Channel coming with-
in the limits of the sheet.

(b) One unmarked channel providing easy connection
across the outer portion of the reef from Hawk Channel to beyond
the outside edge of the reef.

(c) Several searches for particular obstructions.

DETAILS OF DRAGGING:

A detailed account of each days dragging will fur-
nish a good report on the work accomplished.

"A" Day Dragging Hawk Channel, commencing at the
northern limit of the sheet and proceeding south as far as Beacon
No. 8. The effective depth of the finished strip varied from $9\frac{1}{2}$
to 11 feet with one particular area cleared to but $6\frac{1}{2}$ feet when
covering an $8\frac{1}{2}$ foot shoal.

During the first part of this day, a lift of
half a foot was allowed and a foot during the latter half of the
day. These were the maximum lifts observed on any section during
the tests. An average would have been no lift and half a foot
respectively.

Groundings during this day were as follows

(a) Far buoy at position 5A
pulled clear, no sounding.

(b) $8\frac{1}{2}$ feet, 1260 meters 340° from Beacon 5
A mid channel shoal with depths of 18 feet
around it - cleared with $6\frac{1}{2}$ feet drag.

(c) 11½ feet - far buoy end of strip
- large weights dragging low as explained
below - surrounding depths 17 feet.

"B" Day (a) Searching for reported wreck south of Fowey Rock Light. Dragged toward the light from a point 1½ mile south of the light with effective depth as deep as possible. Found two shoals 10½ feet and 6½ feet respectively but no evidence of wreck. The grounding on the 10½ foot spot occurred with an effective depth of 10 feet; a tide change of half a foot was just taking place but not shown.

Later informed locally (Worth Monroe, Coconut Grove) that wreck formerly in this position moved by storm to position 1/2 mile SSW of Cape Florida and now shown on chart along north shore Florida Channel between beacons "12" and "14". Light-keepers also thought this was the case.

(b) Positions 19B - 23B Searching for stub of broken iron beacon which was found at sounding 5b. Stub stands in 12 feet of water coming within 1½ feet of surface, in a somewhat inclined position and with broken off top lying close alongside. This stub constitutes a serious danger for any boats navigating this vicinity.

(c) Positions 24B - 35B - Investigating area where a submerged object was reported struck. Nothing found. 34 ft effective depth

"C" Day Dragging Hawk Channel from southern limit to junction with "A" day at Beacon No. 8.

Drag grounded several times while being put out, resulting in the location of three shoals (7½ - 8½ - 9½ feet) about a third of a mile west of Beacon No. 13 - surrounding depths of 11 - 14 feet.

An 8 foot shoal located just east of strip ^{by tender} (end launch (Pos. 3C)) during course of dragging. Another rock (9 ft) nearby.

Found a 9½ foot shoal 1020 meters 780 from Beacon No. 10 with surrounding depths of 17 feet.

To the westward of Beacon B. S. 9 found a 9 foot spot in a central channel position with surrounding depths of 17 feet.

At end of strip, carried drag strip about Beacon No. 8 to the westward showing that Beacon No. 8 could be moved 200 - 250 meters to the westward and so widen and straighten the marked channel at its most awkward point.

Worth left
a split
which nullifies
this attempt

"D" DAY Started to drag a cross reef channel strip from Beacon No. 5 to southward of Triumph Reef. Forced to discontinue on account of weather. Next day decided to drag shorter cross reef channel to north of Beacon No. 5.

Dragging on this day actually continued beyond position 4D with drag finally becoming fast on sounding 1d (7½ ft). *Drag grounded at Buys 5x9 on Pos 4D with effective depth 10 ft.*

"E" DAY Cross - reef channel strip.

Drag grounded on previous ^{8½} ft. spot (pos. 45A) while being put out. Shortly afterwards grounded at soundings 1e and 2e but no depths found less than drag depth.

Grounded and cleared position 10E, effective depth 9½ ft.
Found 10 foot spot at sounding 3e and 9 foot spot at sounding 4e, both along southern edge of strip.

This strip gives a possible cross-reef channel from the Gulf Stream area to Hawk Channel, passing south of Star Reef and north of Beacon No. 5. It covers all probable foul area between Star Reef and Beacon No. 5 and 6 indicating a clear passage from south of Star Reef to any point between Beacons Nos. 5 and 6.

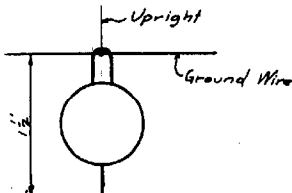
Any passage across the reef at this point leads close to the five (5) foot channel about two miles south of Soldiers Key which is described in the Descriptive Report for Hydrographic Sheet No. _____ (No. 2 - H. A. Cotton - 1934). This is a very direct route for boats of five (5) foot draft and less to pass in and out without using the Cape Florida Channels.

"F" DAY Investigating area of reported wreck. Nothing found except several shoals approximating surrounding depths.

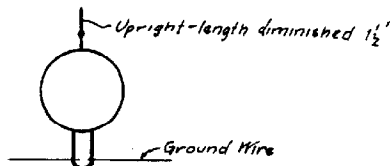
GENERAL

Through the channels on this sheet, it was intended to drag to an effective depth of 10 feet wherever possible. On account of the generally shoal depths, this effective depth of drag frequently required dragging quite close to the bottom. In some instances, lift and tide were not anticipated sufficiently close to give a final effective depth of 10 feet resulting in a couple short sections of Hawk Channel being cleared to but an effective depth of 9½ feet.

On this drag work the large weights were actually dragging 1½ feet deeper than the ground wire. This was on account of the method of making the large weights fast to the drag as shown in sketch.



The method of attaching the large weight was later changed to the following



This excessive depth to which the large weights were dragging accounts for several grounds in depths in excess of the effective depth of drag.

Drag tests will be found recorded in two different ways in the Sounding Record.

(a) Drag Depth	Test Rod Depth	Intercept on Rod	Effective Depth
(b) Drag Depth	Test Rod Depth	Effective Depth	Lift

In the latter case the effective depth is entered directly without the intercept recording

Only one boat sheet is being forwarded with this drag sheet. The Guide Launch used the Hydrographic Boat Sheet for Sheet No. _____ (No. 2 - H. A. Cotton - 1934)

STATISTICS:

Number Linear Miles	24.7
Number of soundings	18
Number of positions	239
Number of angles	717
Sq. Stat. Mi. Area	11.0

Respectfully submitted

Harold A. Cotton

Harold A. Cotton,
Lieutenant Commander, Chief of Party,
U. S. Coast and Geodetic Survey.

ADDENDUM TO DESCRIPTIVE REPORT

FOR WIRE DRAG SHEET NO. _____

²
(No. 2 H. A. Cotton - 1934)

During the dragging over the area of this sheet, the ability to see bottom was considered as justifying the following procedure upon several occasions.

(a) When a shoal could be plainly seen and the least depth obtained without question, it was not considered necessary to again drag over the shoal with a drag set to clear the shoal by two or three feet.

(b) Similarly when shoals could be plainly seen there was believed to be no objection to lifting the drag clear of the shoal and proceeding after the least depth on a shoal had been obtained. On such occasions due precaution was taken to maintain tension on the ground wire during the maneuver.

Field Records Section (Charts)

HYDROGRAPHIC SHEET No. .5540

The following statistics will be submitted with the
cartographer's report on the sheet:

Number of positions on sheet	..239.
Number of positions checked29
Number of positions revised0
Number of soundings recorded18
Number of soundings revised0
Number of signals erroneously plotted or transferred0

Date:.....

Cartographer:.....

Verification of prewriting

Verification & inking of reds and blacks

by J.A.M.-Cormick

Time: 17 hrs.

Verification of inking by

Review by

Henry P. Welsh

Time:

Time: 12 hrs.

Applied to chart 1249 prior to review. J.M.G. 4/6/35

From L. S. S.

Date. November, 8, 1934

GEOGRAPHIC NAMES

FLORIDA

Survey No. H 5540

Chart No. 1249

Diagram No. 1249

Names underlined in red approved Nov 8, 1934
H Bacon

- * Approved by the Division of Geographic Names, Department of Interior.
 ✗, Not Approved by the Division of Geographic Names, Department of Interior.
 R. Referred to the Division of Geographic Names, Department of Interior.

[illegible]

WD LAC

January 8, 1935.

Division of Hydrography and Topography:

✓ Division of Charts: Attention E. P. Ellis

Tide Reducers are approved in
6 volumes of sounding records for
wire drag and

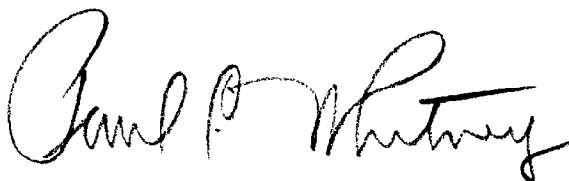
HYDROGRAPHIC SHEET 5540

Locality Fowey Rocks to Elliott Key, Florida Keys.

Chief of Party: H. A. Cotton in 1934
Plane of reference is mean low water reading
2.1 ft. on tide staff at Angelfish Key
3.1 ft. below B.M. 1
2.0 ft. at Soldier Key
1.8 ft. below B. M. 1

Height of mean high water above plane of reference is 2.4 feet at
Angelfish Key; 1.8 feet at Soldier Key.

Condition of records satisfactory except as noted below:



Chief, Division of Tides and Currents.

Records:

Records are in fair condition but the drag party has omitted bottom characteristics for soundings obtained. Assume of effective depths at end of each day is also omitted. Considerable cross reference is necessary at times between the records of the three launches. Signal system used did not seem to function very well.

Abstracting:

Abstracting and drafting were very good. Field draftsman did not observe the proper color scheme in plotting drag strips. Verifier has used the proper colors for effective depths but has not attempted to change the color of the drag strips.

see desc. report

Remarks:

Verifier has been unable to find any guide launch boat sheet. Boat sheet for end launch was submitted. Boat and smooth sheets for H-5536 which shows the hydrography of this area have also been examined but there are no drag lines plotted.

Grounding at Buoy "F", pos 5A, was plotted by verifier.

12' depth was plotted by verifier at Guide Launch position 22A.

16' depth was plotted by verifier at Guide Launch position 32A.

14' depth was plotted by verifier at pos. 8 from sounding taken on Guide Launch between positions 60 and 61A.

Positions 62-65A were removed from the sheet by the verifier as drag was parted and no positions were taken on the end launch. This leaves a split although field party showed the area as covered.

Grounding at Buoy "F" position 61A and recorded in sounding record as 20 was plotted as 11 1/2 feet although the effective depth was 10 1/2 ft. See descriptive

Tow line parted
F buoy
aground.

report for discussion of weight hanging below 2
wire.

Comdr. Cotton makes the statement in his descriptive report that an 8' shoal was located by end launch at position 3C. There is ~~no~~ note in the end launch record concerning this. Sounding obtained by tender and recorded as 16 faths 50 meters east of end launch position 3C but this sounding was taken two hours before end launch reached position 3C. Comdr. Cotton also mentions "another rock (9 ft.) nearby" ~~located by the end launch~~ ^{sufficiently}. No mention of this is made in the end launch record.

Examination of tender records indicates that tender was in process of changing uprights from 8 ft. to 11 ft. when drag started at 1C. Guide launch record says "Buoy 1 and 5 set down again to 11 ft. at 11" which is just after 3C. In the absence of more definite information has changed positions 1-3.4C from an effective depth of $10\frac{1}{2}$ ft. as shown by the field draftsman to an effective depth of $7\frac{1}{2}$ ft.

7 ft. depth was plotted by verifier at Guide launch position 7C.

13 ft. depth was plotted by verifier at ~~Guide~~ between Guide launch positions 9 and 10C.

There is considerable uncertainty in the records between 11 and 14C. Field party has plotted a continuous strip with an effective depth of $10\frac{1}{2}$ feet. Verifier has ~~checked~~ ^{checked} everything between 11 and 14C as being too uncertain. Over ~~an~~ an hour was spent in getting between these positions during which time drag was aground at buoy 9. Verifier has plotted a grounding of $18\frac{1}{2}$ feet from data shown in end launch record under position 14C. This position number does not correspond with position numbers in guide launch record. This grounding was not plotted by field party.

Positions 20-22 C were removed by verifier. Drag party had note "dead line" in record. Area was covered by later work.

Verifier made changes in field plotting of groundings at position 4 D. Field party had plotted a smooth curve between end buoy positions ignoring the fact that drag was aground at buoys "5" and "9". Trawler investigated buoy "5" and obtained a sounding at buoy "5" and obtained a 7 1/2 ft. depth about 100 meters east of the plotted grounding. Grounding at buoy "9" should have been investigated but was not. (Prevented by weather)

Verifier has ~~removed~~ ^{removed} positions 1-8 E from the smooth plotting. Drag grounded at 2 E on an 8 1/2 foot spot located at position 1a. There is some confusion in clearing and drag grounds again at Buoys "N" and "1". Trawler obtained a sounding (1a) which reduces to 13 1/2 ft. Drag had an effective depth of 11 feet and this spot had previously been cleared at 11 feet. Assumption of verifier is that there was insufficient tension in the wire. After position 8 E order was given to reverse and while the end launch was maneuvering to get in position the drag grounded at buoy "9". Again the verifier considers this due to insufficient tension in the wire. Trawler obtained a sounding on this spot (2a) which reduced to 14 1/2 ft. Dragging was resumed at 9 E with an effective depth of 9 1/2 feet. Two minutes later the drag grounded at buoy "8" but immediately slipped off. This area had previously been dragged to 10 1/2 feet. Again it is assumed that tension was insufficient and grounding was not plotted in view of the previous effective depth of 10 1/2 feet.

Drag grounded at buoy "N" on position 10 F. Trawler obtained a sounding about 50 meters S.E. It has been left as shown by the field party. Drag parted at 17 F. Sounding was obtained near buoy "10". It appears from inspection of the plotting that the drag probably also grounded somewhere in the middle

✓

at or shortly after position 16 F. Verifier ⁴
has drawn curve in at position 16 F but
it might be better to carry it back
to 15 F.

Overlay has not been made for
this sheet, awaiting reviewer's action
on the drag work. Smooth curves have
been left at the beginnings of strips
although records contain no notes
concerning "normal drift."

Subsequent to the verification of this
sheet, Lt. C. St. Green instructed the verifier
to sack the questionable areas where drag
grounded and was lifted over the shoal
after a considerable lapse of time. This
was done. Also in places where soundings
obtained were greater than the effective depth
of drag at time of grounding, the effective
depth was plotted on the position obtained
instead of the actual sounding.

April 29, 1935.

Submitted,

J. A. Mc Cormick.

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5540 W. D. (1934)

Fowey Rocks to Elliott Key, Florida

Surveyed in May - September, 1934

Instructions dated November 17, 1933 (H. A. Cotton)

Wire Drag with Hand Lead Soundings.

3 Point Fixes on Shore Signals.

Chief of Party - H. A. Cotton.

Surveyed by - H. A. Cotton.

Protracted by - J. D. Groff.

Soundings penciled by -

Verified and Inked by - J. A. McCormick.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual and S. P. 118, except as follows:

- a. The records, particularly in regard to the end launch, are not sufficiently complete as to groundings and maneuvers after grounding.
- b. Resume of effective depth at end of day's work was omitted (page 37, S. P. 118).
- c. Bottom characteristics on soundings were omitted.
- d. Position angles on shoals were not checked by taking an angle to a fourth object (page 33, S. P. 118).
- e. Drag position number was not entered in the "Remarks" column opposite sounding position number in sounding record (3rd par, page 36, S. P. 118).
- f. Evidence that the transfer of topographic signals was checked in the field was lacking, since the initials of the checker were not shown on the sheet. This was accomplished in the office.

The Descriptive Report is clear and comprehensive, and adequately covers all matters of importance.

2. Compliance with Instructions for the Project.

The plan, character, and extent of the survey satisfy the instructions for the project.

3. Junction with Wire Drag Surveys.

Junction with H-5548 W. D. on the south will be considered in the review of that sheet.

There are no other junctions.

4. Comparison with Contemporary Hydrography.

The present wire drag survey covers a portion of the contemporary hydrographic survey, H-5536 (1934).

The effective drag depths are consistent with the depths shown on H-5536 (1934).

5. Comparison with Chart No. 1249.

The effective drag depths are consistent with the depths shown on Chart 1249.

The wire drag investigation indicates that B. N. 8 should be moved 200 meters to the westward, straightening out the marked channel considerably.

6. Field Plotting.

The field plotting is satisfactory with the following exceptions:

- a. Correct color scheme for plotting drag strips was not used.
- b. Plotting shows lines beginning with normal bight, without authority of reference note to this effect in records.

7. Results of Survey.

- a. The survey shows a clear cross reef channel, dragged to 9 feet from the gulf stream area to Hawk Channel, passing just north of Beacon No. 5 at lat. $25^{\circ}31.2'$, long. $80^{\circ}08.3'$.
- b. Hawk Channel (except for two splits at (a) lat. $25^{\circ}30.2'$, long. $80^{\circ}08.5'$ and (b) lat. $25^{\circ}28.5'$, long. $80^{\circ}09.5'$) shows a clear depth of $9\frac{1}{2}$ feet from the north end of the survey to the south end except for a small $7\frac{1}{2}$ foot strip at lat. $25^{\circ}27'$, long. $80^{\circ}10'$. It is possible that the overlap will cover this strip to the greater ($9\frac{1}{2}$ ft.) depth.

The splits mentioned above were caused by the rejection in the office of positions 61A to 65A and pos. 11c to 14c because the drag was aground several times and explanations in the records were not clear. However, it is quite probable that both of these

splits were actually covered since the drag was lifted clear of such shoals as could be plainly seen. (See addendum to Descriptive Report). After a conference with the Chief of Party it was decided to show these parts of the drag strips with dashed lines.

- c. The wreck reported in Chart Letter No. 509 of 1909, south of Fowey Rock Light, was removed from the chart by authority of Chart Letter No. 531 of 1913. This area was dragged and no evidence of a wreck was found although two shoals of $6\frac{1}{2}$ and 10 feet were located. Local information was obtained that the wreck had been moved by a storm to a position $\frac{1}{2}$ mile SSW. of Cape Florida. (See Descriptive Report p. 2, B day.)
- d. The position of an uncharted reported wreck (H. O. N. to M. 2166 of 1918) in approximate lat. $25^{\circ}27.65'$, long. $80^{\circ}07.15'$ was cleared by a $15\frac{1}{2}$ foot drag strip. Nothing was found except several shoals approximating the surrounding depths.
- e. The broken off channel marker, which was first reported in Chart Letter No. 83 (1923), was located by the drag in lat. $25^{\circ}32.2'$, long. $80^{\circ}06.2'$. It has a least depth of $1\frac{1}{2}$ feet over it and constitutes a menace to navigation.
- f. The numerous shoals located by the drag throughout the area do not require detailed discussion.

8. Additional Field Work Recommended.

No additional work is considered necessary.

9. Reviewed by - H. T. Kelsh and R. L. Johnston, May, 1935.

Inspected by - A. L. Shalowitz.

Examined and approved:

C. K. Green, *C. K. Green*
Chief, Section of Field Records.

L. O. Dolbert
Chief, Division of Charts.

Paul D. Borden
Chief, Section of Field Work.

G. H. de
Chief, Division of H. & T.

Applied to Cht 583, Aug. 21, 1935

f. Reynolds

25 Jan 13, 1936
R.L.D.

Applied to Cht 848 (new compilation), Sept 14, 1938